2.0 Regional Context End State Description

This chapter provides information on the physical features and land use for the region surrounding the Hanford Site. Maps (Figures 2.1a, 2.1b, 2.1c, 2.2a, and 2.2b) showing the current conditions and the end state vision conditions are included in each section.

2.1 Physical and Surface Interface

The Hanford Site lies within the semi-arid Pasco Basin of the Columbia Plateau in southeast Washington State. The Columbia Plateau is a broad plain situated between the Cascade Range to the west and the Rocky Mountains to the east. This plateau was formed by a thick sequence of Miocene-Age tholeiitic basalt flows, called the Columbia River Basalt Group, which emanated from fissures in north central and northeastern Oregon, eastern Washington, and western Idaho (Swanson et al. 1979). In the central and western sections of the Columbia Plateau, where the Hanford Site is located, the Columbia River Basalt Group is underlain by continental sedimentary rocks from earlier in the Tertiary Period.

Four major geologic processes, occurring over millions of years, formed the soil, rocks, and geologic features of the area. The area was flooded with numerous basaltic lava flows between 17 and 6 million years ago, followed by tectonic forces that folded the basalt. In this landscape, the ancestral Columbia River meandered across the area leaving behind layers of sediment called the Ringold Formation. About 12,000 years ago the area was inundated by a series of Ice Age floods (including the Missoula Floods), which deposited more sediment in what is referred to informally as the Hanford formation. Major manmade and natural features of the region for the current and end state vision are shown on Figures 2.1a and 2.1b. Few regional changes are expected to affect these features between now and completion of cleanup with the exception of the footprint of the Hanford Site.

Hanford is a dry area, known for its sandy soil, basalt ridges, and shrub-steppe vegetation. Precipitation in the area averages less than 15.8 centimeters (6.2 inches) per year. Surface water enters the Pasco Basin from several other basins that include the Yakima River Basin, Horse Heaven Basin, Walla Walla River Basin, Palouse/Snake Basin, and the Big Bend Basin. The major rivers in the area are the Columbia, Snake, Yakima, and Walla Walla Rivers. Figure 2.1c shows the major drainage basins in the region contributing to the Columbia River.

2.2 Human and Ecological Land Use

Historically, Native Americans used the Columbia River extensively for fishing, hunting, gathering, and pasturing of livestock. By the turn of the century, settlers had moved into the region and developed irrigated farms. Grand Coulee Dam was built on the Columbia River in the 1940s. The Columbia Irrigation Project brought more water for farming and the population increased in Franklin County, across the Columbia River from Hanford.

Currently, land use within the vicinity of the Hanford Site includes urban and industrial development, wildlife protection areas, recreation, irrigated and dryland farming, and grazing. According to the 1992 Census of Agriculture, Benton, Franklin, and Grant counties had a total of 9,586 square kilometers (3,745 square miles) of land in farms, of which 6,670 square kilometers (2,606 square miles) were in

cropland. Approximately 46% of cropland was irrigated in 1992, and ~40% of cropland in 1992 was used as pastureland. According to the 1992 census, the total market value of agricultural products in the three counties was $935 million, including $758 million for crops and $177 million for livestock. In 1994, wheat represented the largest single crop (in terms of area) planted in Benton and Franklin counties. The total area planted in the two counties was 975 square kilometers (376 square miles) and 120 square kilometers (46.4 square miles) for winter and spring wheat, respectively. Other major crops such as alfalfa, apples, asparagus, cherries, corn, grapes, and potatoes are also produced in Benton and Franklin counties. In 1994, the Conservation Reserve Program of the U.S. Department of Agriculture[1] included 102.8 square kilometers (39.7 square miles) in Benton County, 93.6 square kilometers (36.1 square miles) in Franklin County, and 101.1 square kilometers (39 square miles) in Grant County.[2]

In 1992, the Columbia Basin Project, a major irrigation project north of the Tri-Cities, produced gross crop returns of $552 million, representing 12.5% of all crops grown in Washington State. Also, in that year, the average gross crop value per irrigated acre was $1,042. The largest percentage of irrigated acres produced alfalfa hay (26.1% of irrigated acres), wheat (20.2%), and feed-grain corn (5.8%).

Land use in the region surrounding the Hanford Site is not expected to change drastically during the upcoming decades. It is assumed that the region will continue to be dedicated to agricultural and that populations may increase mainly around the current urban areas. Current and end state regional human and ecological land use are shown in Figures 2.2a and b.

[1] Agricultural lands at risk for soil erosion set aside to enhance wildlife.

[2] Personal communication from R Hamilton, Conservation Program Specialist with the U.S. Department of Agriculture, Farm Service Agency, in Spokane, Washington, October 1997.

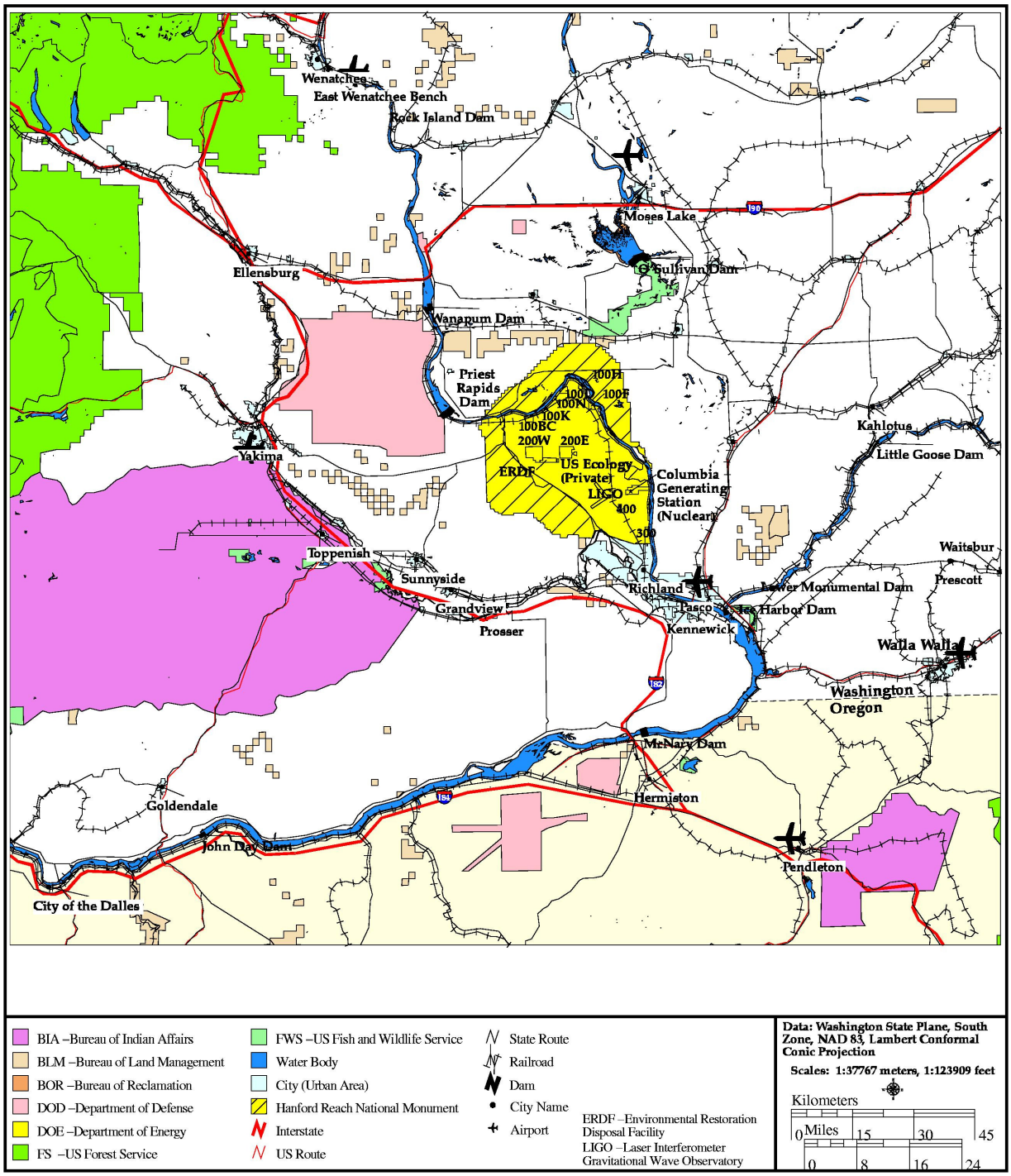

Figure 2.1a. Regional Physical and Surface Interface – Current State

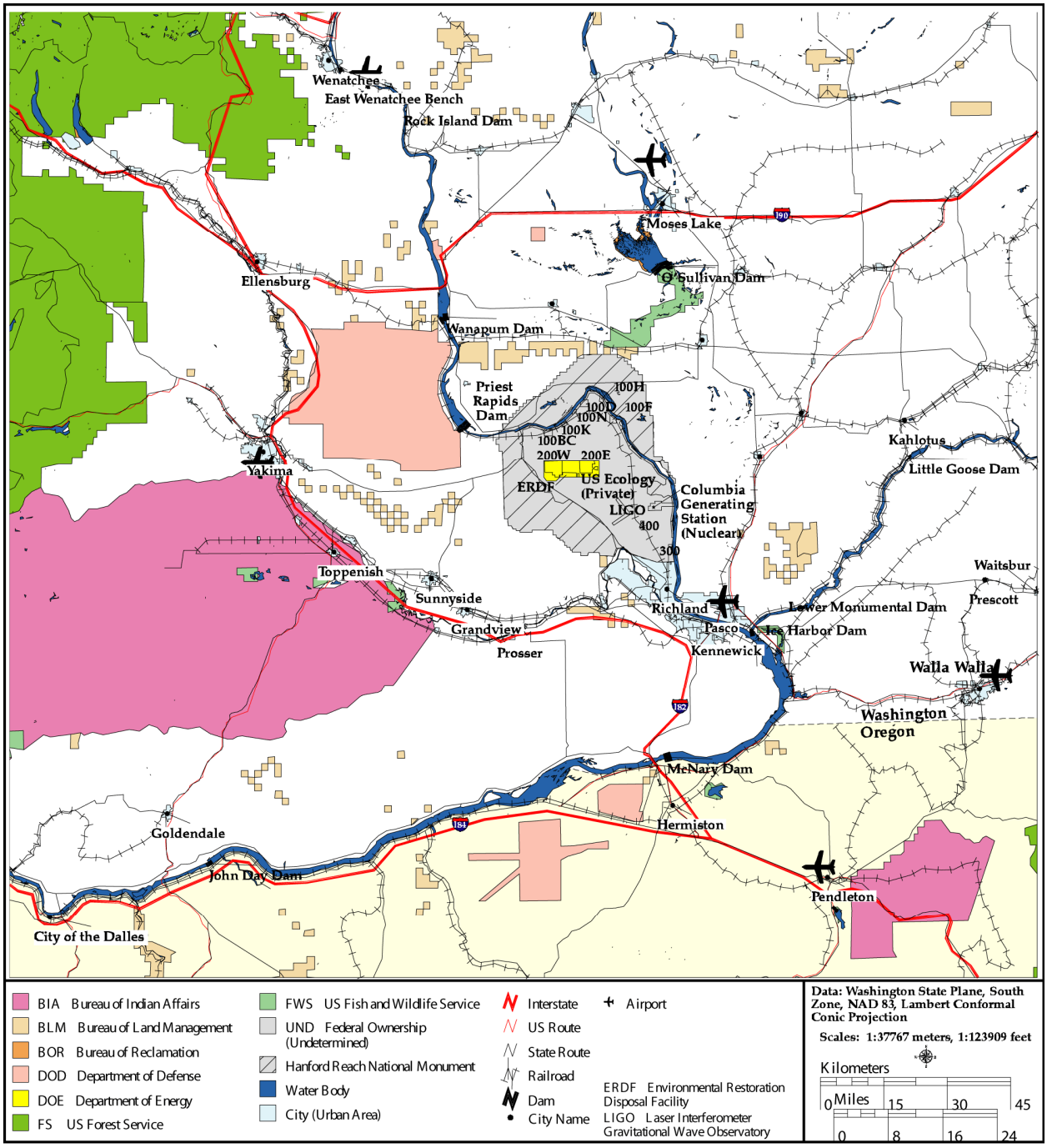

Figure 2.1b. Regional Physical and Surface Interface – End State Vision

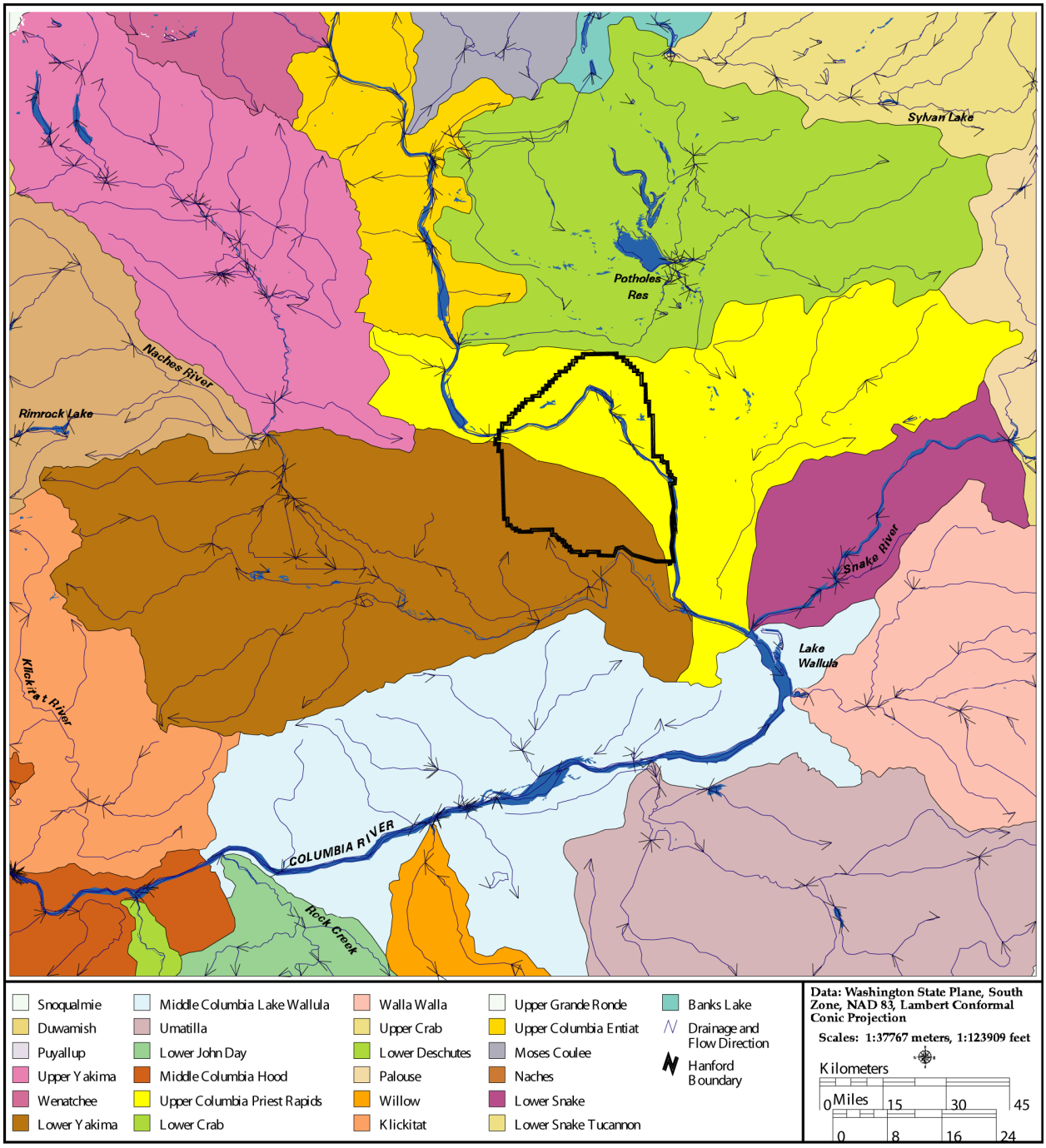

Figure 2.1c. Columbia River Watershed

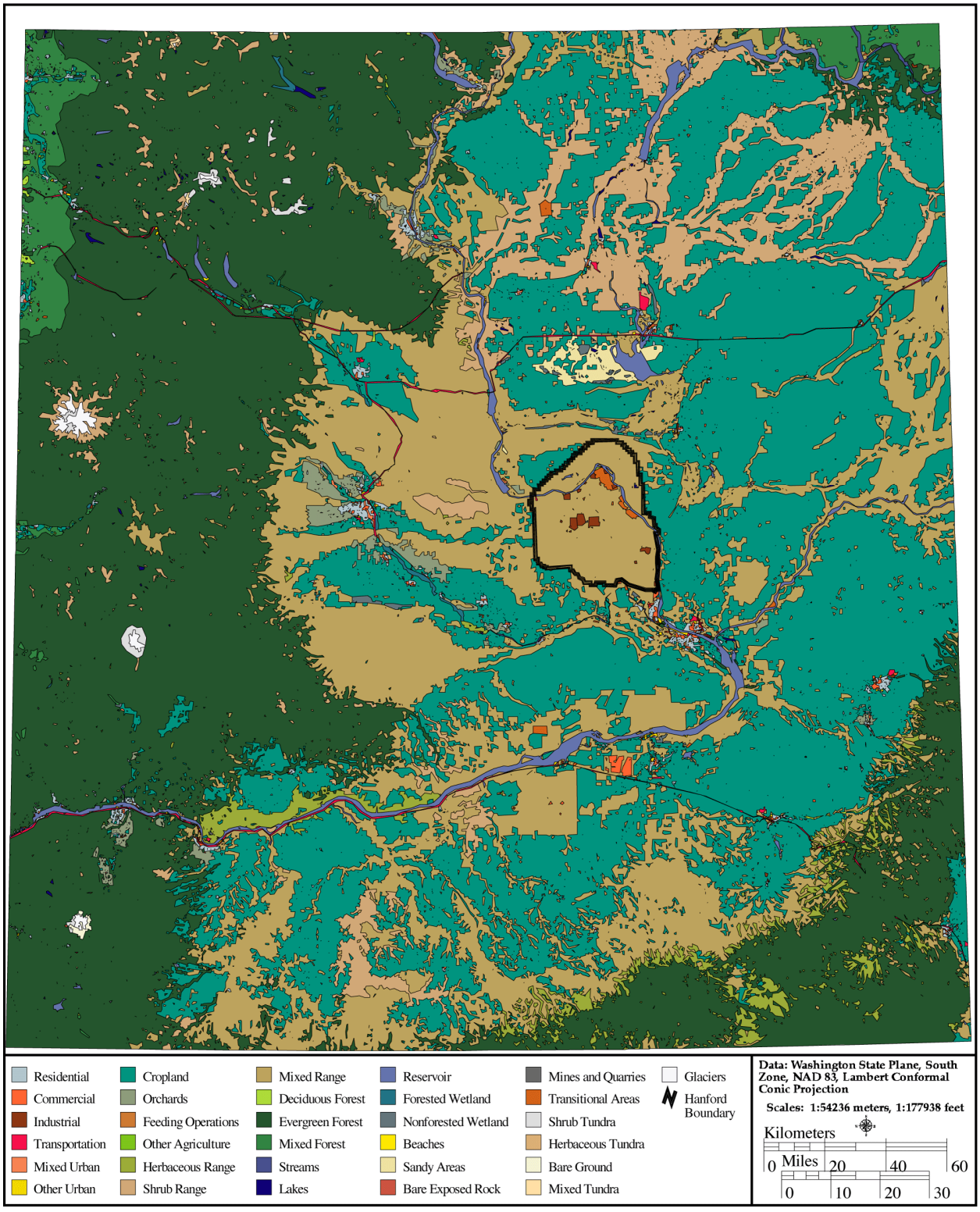

Figure 2.2a. Regional Human and Ecological Land Use – Current State

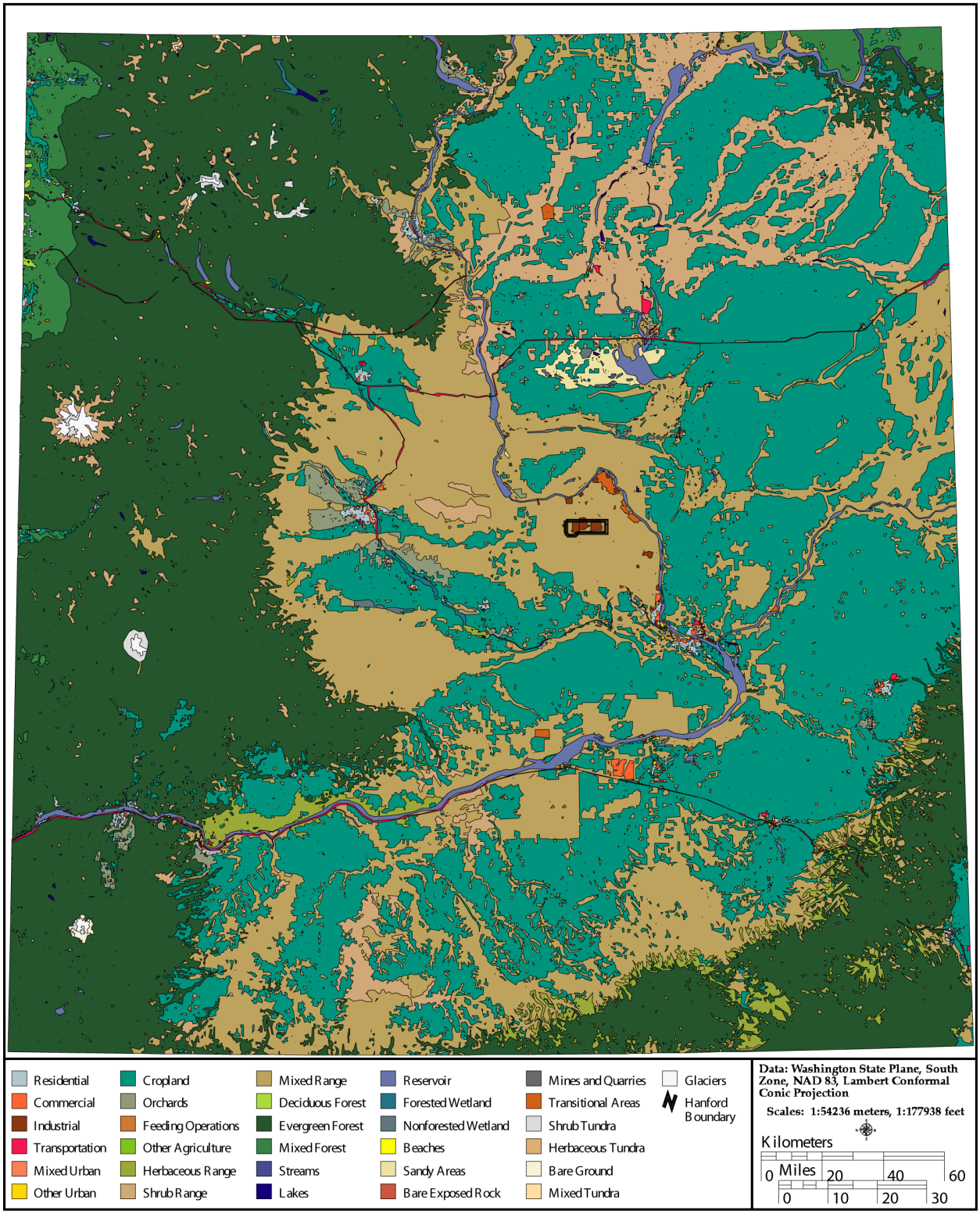

Figure 2.2b. Regional Human and Ecological Land Use – End State Vision